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State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

June 15, 2010

Kenneth D. Landau, Assistant Executive Officer
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Dear Mr. Landau:

REQUEST FOR HEALTH RISK ASSESSMENT FOR SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT (SRCSD) DISCHARGE TO SACRAMENTO RIVER, SACRAMENTO COUNTY

This is in response to your May 11, 2009 letter in which you requested a health risk assessment from the California Department of Public Health (Department) for the SRCSD treated wastewater discharge to the Sacramento River immediately downstream of the Freeport Bridge to ensure the renewed permit is adequately protective of the beneficial uses. Specifically, you requested guidance on the appropriate disinfection requirements for the removal of pathogens in the renewed NPDES permit for human health protection.

In our initial review of the information you provided, we found that the data from SRCSD's monitoring for *Giardia* cysts and *Cryptosporidium* oocysts recorded concentrations that might pose a risk to persons engaged in body contact recreation in the portions of the Sacramento River affected by the discharge. In subsequent meetings with your agency and the SRCSD, we determined that a formal risk assessment was appropriate. SRCSD engaged the professional services of Dr. Charles Gerba of the University of Arizona to prepare the study, which he presented at a meeting with SRCSD and our agencies on September 28, 2009.

Dr. Gerba's analysis estimates that the additional risk of illness and infection to swimmers posed by swimming in the Sacramento River would be as follows:

Health Risks Associated With Swimming in the Sacramento River With Reference to SRCSD Discharge (*Giardia and Cryptosporidum Combined*)

Single Swimming Exposure				
Location	Risk of Illness (E-04)		Risk of Infection (E-04)	
	Average	95 percentile	Average	95 percentile
8 miles upstream	1.3	1.5	2.6	3.0
100 feet upstream	1.2	1.4	2.4	2.8
0.5 miles downstream	1.8	2.1	3.6	4.2
1.5 miles downstream	3.4	5.2	6.8	10.4
20:1 diluted effluent	5.2	6.3	10.4	12.6

Dr. Gerba concludes that the risks do not exceed the U.S. Environmental Protection Agency (EPA) Acceptable Risk Level (ARL) in its Recreational Water Quality Criteria. These numbers were established in 1986, and were based on acceptable risk levels that were extrapolated from the 1968 Federal Water Quality Criteria (We note that Dr. Gerba's analysis contains an incorrect citation of the EPA's ARL as being 19 in 1,000, which is the ARL in salt water recreation areas. The EPA's ARL in fresh water recreation areas is 8 in 1,000.)

In the case of the SRCSD discharge, the CDPH does not consider conformance with the EPA's Recreational Water Quality Criteria (Criteria) to provide adequate public health protection. This view is based on the following:

1. The Criteria are based on risks posed by ambient recreational waters, where the pathogens detected are from human and animal sources. In the case under consideration, the discharge appears to be contributing at least 30 percent of the pathogens detected in the receiving waters. The human origin of these pathogens renders them more hazardous to swimmers.
2. The discharge is a controllable source, and the risk it poses may be abated by additional treatment. This is not true of waters impacted by non-point sources.
3. The Criteria represent a trade-off between the public's desire to swim in natural waters, and the minimum level of risk that could reasonably be achieved in 1986. CDPH questions whether this represents a level of risk that is currently "acceptable" to the public.
4. CDPH considers a 1 in 10,000 risk of infection to be an acceptable risk from exposure to treated sewage effluents, and used this as a basis for its Recycled Water Regulations. Dr. Gerba estimates that the average risk of infection from a single swimming exposure to the effluent is approximately one order of magnitude higher than this threshold. The estimated risk of infection from ten such exposures is two orders of magnitude higher.

CDPH therefore recommends that the SRCSD provide additional treatment sufficient to reduce the additional risk of infection posed by exposure to its discharge to as close to 1 in 10,000 as can be achieved by a cost-effective combination of using filtration and/or a disinfection process that effectively inactivates *Giardia* cysts and *Cryptosporidium* oocysts.

Sincerely,

Gary H. Yamamoto, P.E., Chief
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